

CLAIMS

1-15 (cancelled)

16. (new) A method for impregnating lumber, comprising submerging a piece of lumber in a polymerizable furfuryl alcohol monomer mixture, said mixture comprising water, furfuryl alcohol, a stabilizer and an initiator, wherein the stabilizer is selected from the group consisting of sodium carbonate, sodium bicarbonate, sodium citrate, phosphates and water-soluble lignin derivatives, and the initiator is selected from the group consisting of maleic anhydride, phthalic anhydride, maleic acid, malic acid, phthalic acid, benzoic acid, malonic acid, ascorbic acid, boric acid, citric acid, zinc chloride, aluminum chloride, other cyclic organic anhydrides and acids, and combinations thereof, applying a pressure of from 1-10 bar in a pressure step, and curing the piece of wood in a curing step.

17. (new) The method according to claim 16 wherein the stabilizer is selected from the group consisting of sodium carbonate, sodium bicarbonate, sodium citrate and phosphates.

18. (new) The method according to claim 16 wherein the stabilizer is selected from the group consisting of sodium carbonate, sodium bicarbonate and sodium citrate.

19. (new) The method according to claim 16 wherein the stabilizer is sodium carbonate or sodium bicarbonate.

20. (new) The method according to claim 16 wherein the stabilizer is sodium bicarbonate.

21. (new) The method according to claim 16, wherein the concentrations of the furfuryl alcohol, stabilizer and initiator, based on weight of water, are 2-90%, greater than zero -10%, and 0.4-5% respectively.

22. (new) The method according to claim 21, wherein the concentrations of stabilizer and initiator are 0.2 – 4.75 % and 0.4-3.5% respectively.

23. (new) The method according to claim 16 further comprising a vacuum step.
24. (new) The method according to any one of claims 16-23, wherein the initiator is maleic anhydride.
25. (new) The method according to any one of claims 21 or 22 wherein the pH of the mixture is from 3.5 to 4.
26. (new) A method of impregnating wood in a full cell process, comprising the steps of:
- i) loading an impregnation vessel with wood and securing the wood so it will not float
 - ii) closing the vessel and drawing a partial vacuum,
 - iii) filling the vessel with a treating mixture, while maintaining vacuum, said treating mixture comprising water, furfuryl alcohol, a stabilizer and an initiator, wherein the stabilizer is selected from the group consisting of sodium carbonate, sodium bicarbonate, sodium citrate, phosphates and water-soluble lignin derivatives, and the initiator is selected from the group consisting of maleic anhydride, phthalic anhydride, maleic acid, malic acid, phthalic acid, benzoic acid, malonic acid, ascorbic acid, boric acid, citric acid, zinc chloride, aluminum chloride, other cyclic organic anhydrides and acids, and combinations thereof,
 - iv) pressurizing the submerged wood to a pressure in the range of 5 to 10 bar,
 - v) reducing pressure to 2 or 3 bar, and expelling the treating fluid with remaining pressure,
 - vi) releasing all pressure, opening door and removing treated wood.
27. (new) A formulation for impregnating wood, comprising water, furfuryl alcohol, a stabilizer and an initiator, wherein the stabilizer is selected from the group consisting of sodium carbonate, sodium bicarbonate, sodium citrate and phosphates, and the initiator is selected from the group consisting of maleic anhydride, phthalic anhydride, maleic acid, malic acid, phthalic acid, benzoic acid, malonic acid, ascorbic acid, boric acid, citric acid, zinc chloride, aluminum chloride, other cyclic organic anhydrides and acids, and combinations thereof.
28. (new) The formulation according to claim 27, wherein the stabilizer is selected from the group consisting of sodium carbonate, sodium bicarbonate and sodium citrate.

29. (new) The formulation according to claim 27, wherein the stabilizer is sodium carbonate or sodium bicarbonate.
30. (new) The formulation according to claim 27, wherein the stabilizer is sodium bicarbonate.
31. (new) The formulation according to claim 27, wherein the concentrations of the furfuryl alcohol, stabilizer and initiator, based on weight of water, are 2-90%, greater than zero -10%, and 0.4-5% respectively.
32. (new) The formulation according to claim 31, wherein the concentrations of stabilizer and initiator are 0.2 – 4.75 % and 0.4-3.5% respectively.
33. (new) The formulation according to any one of claims 27-32, wherein the pH of the mixture is from 3.5 to 4.